WASHINGTON STATE

Teachers Retirement System

Experience Study

1989 - 1994

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I. Introduction

This is a report of the findings of our study of the Teachers Retirement System for the six-year period ending June 30, 1994. The purposes of this experience study are to:

- Review actual experience in relation to the current actuarial assumptions;
- Review the actuarial method and other aspects of the actuarial basis;
- Develop any changes in the actuarial basis (actuarial method and actuarial assumptions) as may be indicated by such review; and
- Create data and statistics required for other applications.

There are two distinct types of assumptions used in an actuarial valuation:

(1) Demographic assumptions -- estimating flows of people through the system and non-economic factors that affect benefits.

(2) Economic assumptions -- estimating the impacts of economic factors on benefits and salaries and their present values.

II. Summary of Demographic Findings

Mortality

Mortality of retirees continues to improve for all ages.

Retirement

Retirement rates have been slightly lower than expected.

Disability

Disability rates have continued a long, steady decline.

Termination

Termination rates have been slowly declining for about a decade. During the 1989-1993 Experience Study Period, termination rates were 21% below expected.

Vested Termination

Members who terminated generally left their contributions in the system more often than they had in the previous study period.

Step/Longevity Salary Increase

We have changed the structure to recognize that educational and promotional increases occur throughout a career.

Cashouts, Extra Contracts, and Boosting the Average Final Compensation

Members experienced above-average salary increases prior to retirement resulting in a 2% increase in Average Final Compensation.

III. Demographic Assumptions

GENERAL

Demographic assumptions are those which can be readily established by statistical studies of past experience. All data used in this study was provided by the Department of Retirement Systems. The data used was based on the information provided for the annual actuarial valuation of TRS for 1989-94.

The valuation detail files for 1989-94 were merged to produce a single record for each person who was a member of the system during any part of the study period. Each record provides a service and salary history over the study period.

We analyzed this file for each of four causes of decrement: mortality, retirement, disability, and turnover. Our analysis revolved around ratios of actual to expected experience, both year-by-year and for the entire study period. Tables showing ratios of actual to expected experience both on the old and suggested new basis will be set out for each decrement as it is discussed.

MORTALITY

There are four mortality bases to be reviewed. Post-Disablement Mortality, Pre-Retirement Mortality, Post-Retirement Mortality, and Beneficiary Mortality.

During the winter of 1995 the Society of Actuaries published a draft of the 1994 Uninsured Pensioner Mortality Table (UP 94). The final version was not expected to be adopted until after the completion of this experience study. Therefore it was decided that the preliminary UP 94 should be used. In the event the table adopted varies from the preliminary table, changes will be reflected and noted in the 1995 valuation.

We shall use the convention UP 94(-3,-1) to abbreviate 1994 Uninsured Pensioner Mortality Table with male ages set back three years and female ages set back one year. A setback is used when the mortality of the plan's members is lower than that used in developing the table. For example, if the experience of 70-year-olds in the plan is that of 67-year-olds in the mortality table, a three-year setback is used.

The table established during the 1985-88 study of active and retiree mortality was the 1983 Group Annuity Mortality Table, or 1983 GAM(-3,-1). During the 1989-94 study, an error was discovered in the previous experience study. The previous study should have developed the 1983 GAM(-2,0). However, as mortality has steadily improved, the 1983 GAM(-3,-1) turned out to be a good fit to actual experience for the 1989-94 period.

Mortality rates have steadily declined through the years (though not uniformly by age or sex) reflecting advances in medicine, the availability of paramedics, etc. We have not explicitly reflected future mortality improvements in our new assumption, but have done so implicitly.

Male mortality experience fell between a three-year and a two-year setback. Female mortality fell between a zero and a one-year setback. Our choice of a three-year setback for males and one-year for females reflects both conservatism and short-term mortality improvement.

Post-Disablement Mortality

The effect of many disabilities on mortality is short-lived. Immediately following disablement, mortality is high, but then lessens and over time mortality approaches that of the overall population. A way to accommodate these trends is to use a standard table with a floor. Our disabled life mortality assumption will be the UP 94 table set back three years for males, one year for females but never less than 2½% for males and 2% for females.

Post-Retirement Mortality

This is most significant of mortality assumptions due to its impact on actuarial results.

Pre-Retirement Mortality

Mortality rates of active members prior to retirement age are very small and have limited impact on actuarial results. Also, because many illnesses force termination prior to death, mortality is difficult to determine. For these reasons we will use the same basis for pre-retirement as for post-retirement mortality.

Beneficiary Mortality

This group includes both the beneficiaries of active duty deaths and the beneficiaries of retiree deaths. We will use the same table for beneficiaries as for retirees.

Tables 1 and 2 demonstrate the actual and expected deaths on both the old and the new basis for post-retirement and disability mortality. Although we do not use remaining life expectancies in our calculations, they provide a good basis on which to compare mortality assumptions and to demonstrate levels of mortality. The table on the following page shows remaining life expectancies of retirees for various retirement ages. Tables 3 and 4 contain sample rates of mortality.

Pre- and Post-Retirement Mortality

Old Basis: The 1983 GAM Table: Male ages are set back three years; female ages are set back one year.

New Basis: The UP 94 Table: Male ages are set back three years; female ages are set back one year.

LIFE EXPECTANCY

	Old Assumptions		New Assumptions	
Age	Male	Female	Male	Female
30	51.0	55.3	51.4	54.1
40	41.3	45.5	41.8	44.3
50	31.9	35.9	32.4	34.7
60	23.1	26.6	23.3	25.5
70	15.2	17.9	15.6	17.3
80	9.1	10.8	9.5	10.4
90	5.1	5.8	5.2	5.3

Disabled Life Mortality

Old Basis: The 1983 GAM Table: Male ages are set back three years; female ages are set back one year. Mortality is the greater of the above and 4½% for males and 3% for females.

New Basis: The UP 94 Table: Male ages are set back three years; female ages set back one year. Mortality is the greater of the above and 2½% for males and 2% for females.

TABLE 1

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Mortality Experience
Post-Retirement
1989 - 1994

		1983 Group Annuity Mortality *		1994 Uninsured Pensioner Mortality *	
Age	Actual	Expected	Ratio	Expected	Ratio
-54	5	4	1.25	3	1.67
55-59	54	46	1.17	37	1.46
60-64	140	146	.96	145	.97
65-69	249	260	.96	289	.86
70-74	353	387	.91	404	.87
75-79	494	557	.89	541	.91
80-84	854	799	1.07	778	1.10
85-89	900	803	1.12	830	1.08
90+	838	639	1.31	701	1.20
Total	3,887	3,641	1.07	3,726	1.04

* Male ages are set back 3 years; females 1 year

TABLE 2

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Mortality Experience
Post-Disablement
1989 - 1994

		OLD ASSUMPTIONS		NEW ASSUMPTIONS	
Age	Actual	Expected	Ratio	Expected	Ratio
-44	2	4	.50	3	.67
45-49	12	10	1.20	6	2.00
50-54	12	22	.55	13	.92
55-59	16	36	.44	21	.76
60-64	25	38	.66	23	1.09
65-69	26	30	.87	18	1.44
70-74	19	17	1.12	11	1.73
75-79	15	8	1.88	7	2.14
80-84	9	4	2.25	4	2.25
85+	7	8	.88	8	.88
Total	143	178	.80	114	1.25

TABLE 3

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Probability of Mortality
Actives, Retirees and Beneficiaries

Age	Male Mortality	Female Mortality
20	.0463%	.0301%
25	.0598%	.0313%
30	.0782%	.0356%
35	.0902%	.0482%
40	.0958%	.0701%
45	.1346%	.0992%
50	.2042%	.1408%
55	.3455%	.2241%
60	.6001%	.4154%
65	1.0911%	.8194%
70	1.9391%	1.3665%
75	3.0625%	2.1915%
80	4.8570%	3.8024%
85	8.1217%	6.5569%
90	12.4377%	11.2467%
95	19.6001%	18.3524%

TABLE 4

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Probability of Mortality
Disabled Members

	Male Mortality	Female Mortality
20	2.50%	2.00%
25	2.50%	2.00%
30	2.50%	2.00%
35	2.50%	2.00%
40	2.50%	2.00%
45	2.50%	2.00%
50	2.50%	2.00%
55	2.50%	2.00%
60	2.50%	2.00%
65	2.50%	2.00%
70	2.50%	2.00%
75	3.06%	2.19%
80	4.86%	3.80%
85	8.12%	6.56%

SERVICE RETIREMENT

Plan I

The ages at which members retire is a major factor in the cost of a retirement system. Our study of service retirement shows few changes in retirement rates with one exception: Plan I members with 30 years of service exhibited lower retirement rates than in the previous study period.

Following the 1982 Early Retirement Window there were fewer retirements because: (1) there were fewer eligible to retire, and (2) those most inclined to retire as soon as possible already had done so during the "Window" period. The retirement experience of 1983-87, therefore, did not reflect the experience one might expect over the long term. Retirements taking place after the 1992 "Window" will be excluded from our study for the same reasons.

Plan II

There is little actual experience on which to base Plan II retirement rates. Few members have reached age 65 and they are not typical employees. No one is eligible for actuarially reduced early retirement. Twenty years of service is required and Plan II started in 1977.

Given the similarity between Plan II retirement eligibility and Social Security eligibility, it seems reasonable that most members will consider the two together. We would expect Plan II members to retire at ages similar to Social Security. Retirements prior to age 62 will primarily be the result of ill health.

RETIREMENT ELIGIBILITY

	Plan I	Plan II
Full Benefits:	Age 60 & 5 Years of Service	Age 65 & 5 Years of Service
	or	or
	Age 55 & 25 Years of Service	Age 55 & 20 Years of Service (Actuarially Reduced)
	or	
	Any Age With 30 Years of Service	
Maximum Benefit:	60%	None

Retirement

Old Basis: Table based upon 1985-1988 Teachers Retirement System experience.

New Basis: Plan I - Table based upon 1989-1993 Teachers Retirement System experience. (During the 1992 Legislative Session an early retirement window was opened, effective the beginning of the 1993 Fiscal Year. This introduced a bias into retirement rates for the next several years. Thus, experience from 1994 was not used.)

Plan II - Unchanged.

Please see Table 6 for the new Plan I retirement rates, and Table 7 for the new Plan II retirement rates.

TABLE 5

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Plan I Retirement Experience
1989 - 1993*

		OLD ASSUMPTIONS		NEW ASSUMPTIONS	
Age	Actual	Expected	Ratio	Expected	Ratio
-52	159	262	.61	226	.70
53	215	234	.92	212	1.01
54	226	261	.87	225	1.00
55	533	594	.90	555	.96
56	376	452	.83	427	.88
57	347	402	.86	380	.91
58	293	347	.84	336	.87
59	335	291	1.15	321	1.04
60	576	466	1.24	501	1.15
61	377	326	1.16	356	1.06
62	458	468	.98	466	.98
63	257	253	1.02	265	.97
64	182	177	1.03	183	.99
65	208	223	.93	223	.93
66+	269	275	.98	275	.98
Total	4,811	5,033	.96	4,950	.97

* Retirements due to an early retirement window in 1993 have been excluded.

TABLE 6

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Service Retirement
Probability of Retirement
Plan I Members Eligible to Retire

	SERVICE NOT EQUAL TO 30 YEARS		SERVICE EQUAL TO 30 YEARS	
Age	Male	Female	Male	Female
-53	20%	25%	40%	30%
54	25%	20%	40%	30%
55	25%	20%	40%	30%
56	20%	25%	35%	30%
57	20%	25%	35%	30%
58	20%	25%	40%	30%
59	25%	25%	45%	30%
60	25%	20%	45%	30%
61	25%	20%	60%	35%
62	40%	35%	60%	55%
63	35%	30%	60%	50%
64	35%	30%	60%	50%
65	60%	50%	90%	90%
66-69	30%	30%	90%	90%
70+	*	*	*	*

* Immediate retirement is assumed for every person who attains age 70.

TABLE 7

WASHINGTON STATE TEACHERS

RETIREMENT SYSTEM

Service Retirement
Probability of Retirement
Plan II Members Eligible to Retire

Age	Male	Female
55-56	2%	5%
57-58	3%	6%
59	3%	8%
60	4%	10%
61	6%	10%
62	45%	60%
63	30%	25%
64	40%	40%
65	67%	70%
66-69	50%	40%
70	*	*

* Immediate retirement is assumed for every person who shall have attained age 70.

DISABILITY

Disability is a relatively minor decrement in TRS. Experience has been below the rates developed in the last experience study. Disability rates will be reduced for all ages, but more for women than men. The assumptions are the same for Plans I and II. Duty and non-duty disability are not distinguished.

Old Basis: Disability Table based on 1985-88 Teachers Retirement System experience.

New Basis: Disability Table based on 1989-94 Teachers Retirement System experience.

TABLE 8

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Disability Experience
1989 - 1994

		OLD ASSUMPTIONS		NEW ASSUMPTIONS	
Age	Actual	Expected	Ratio	Expected	Ratio
-34	0	4	.00	4	.00
35-39	1	11	.09	10	.10
40-44	23	43	.53	27	.85
45-49	62	94	.66	50	1.24
50-54	53	119	.45	62	.85
55+	42	76	.55	45	.93
Total	181	348	.52	197	.92

TABLE 9

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Probability of Disablement

Age	Male and Female
20	.0010%
25	.0068%
30	.0140%
35	.0240%
40	.0320%
45	.0705%
50	.1220%
55	.2500%
60*	.3500%
64	.5387%

* Plan I we assume no disabilities for ages 60+

TERMINATIONS

Our study indicates that general employment turnover has declined since the last study. The patterns of turnover are very high in the early years of service and fall off rapidly thereafter.

At least two successive years of experience are needed to determine the status of a terminating member with any degree of confidence due to the significant number of members who return to work following a short absence.

On the following pages are tables showing the actual and expected terminations using the old and new assumptions. Table 11 contains sample rates of termination.

Old Basis: Plan I and Plan II termination tables based on the 1985-88 Teachers Retirement System experience with a ten-year select period.

New Basis: Plan I and Plan II tables based on the 1989-93 Teachers Retirement System experience.

TABLE 10

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Termination Experience
1989 - 1993

Years of Service	Actual	OLD ASSUMPTIONS Expected	OLD ASSUMPTIONS Ratio	NEW ASSUMPTIONS Expected	NEW ASSUMPTIONS Ratio
0-1	3,072	4,136	.74	3,086	1.00
2-3	1,760	2,498	.70	1,720	1.02
4-5	1,006	1,324	.76	1,036	.97
6-7	621	686	.91	644	.96
8-9	453	449	1.01	424	1.07
10-11	322	226	1.42	323	1.00
12-13	280	228	1.23	264	1.06
14-15	222	211	1.05	204	1.09
16-17	181	195	.93	170	1.06
18-19	147	184	.80	144	1.02
20-21	120	171	.70	121	.99
22-23	108	148	.73	99	1.09
24-25	75	111	.68	73	1.03
Total	8,367	10,567	.79	8,307	1.01

TABLE 11

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

General Employment Turnover
Probability of Termination in the Next Year

Years of Service	Male	Female
0	7.50%	7.00%
1	7.50%	7.00%
2	6.00%	6.00%
3	5.10%	5.30%
4	4.50%	4.80%
5	3.90%	4.20%
6	3.40%	3.90%
7	2.90%	3.40%
8	2.50%	3.00%
9	2.10%	2.50%
10	1.90%	2.20%
11	1.80%	2.00%
12	1.60%	1.65%
13	1.40%	1.49%
14	1.24%	1.31%
15	1.10%	1.20%
16	1.00%	1.10%
17	.90%	1.01%
18	.80%	.95%
19	.70%	.90%
20	.65%	.82%
21	.60%	.78%
22	.60%	.71%
23	.60%	.69%
24	.60%	.65%
25+	.60%	.62%

TERMINATION WITH VESTED BENEFIT

The probability of vesting upon termination is a function of age. For younger people, a return of contributions will exceed the discounted value of the future pension benefit. Also there are competing demands for dollars such as mortgage and car payments, and pension savings rarely win out. The reverse is true for older people. Table 12 displays sample vesting rates.

Old Basis: Probability of Vesting Upon Termination Table based on 1985-88 Teachers Retirement System experience.

New Basis: Unchanged.

TABLE 12

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Probability of Vesting Upon Termination

Age	Male	Female
20	16%	35%
25	20%	40%
30	20%	40%
35	20%	45%
40	25%	50%
45	30%	55%
50	56%	72%
55	75%	90%
60	100%	100%

PORTABILITY

Portability increases the liabilities associated with dual members. The increased costs are a function of their salary and service in their later system. The 1989-94 Experience Study determined the following for dual members who are no longer active members:

PERCENTAGE OF TERMINATIONS WITH DUAL MEMBERSHIP

	Service ≥5 Years	Service <5 Years
TRS I	3.50%	8.52%
TRS II	2.53%	2.47%

AVERAGE SALARY OF TERMINATED VESTED

	All	Dual Members
TRS I	$20,600	$35,800
TRS II	$22,200	$27,300

SALARY INCREASE

Salary increases usually have two parts: (1) a cost-of-living or inflation component, and (2) a step/longevity increase. For teachers the step increase may be a measure of either years of service, education or promotion. This experience study will focus on the step portion of pay increases. The cost-of-living component will be studied with other economic factors in 1995.

Each biennium the state establishes a pay scale for purposes of funding. Through the passage of levies, federal funding, etc., each school may have its own method of granting salary increases. What follows is a model for the aggregate of all pay, including that funded by the state as well as additional amounts provided by the local school districts.

We have developed an average scale by studying the salaries reported to the Department of Retirement Systems. Table 13 displays the actual and expected step increases for the Study Period. Table 14 displays the new assumption. The new rates extend beyond 15 years to recognize that educational and promotional increases occur throughout a career.

STEP/LONGEVITY SALARY INCREASE

Old Basis: Scale based on Salary Scale included in the 1989-91 Biennial Budget with a 14-year select period.

New Basis: Scale based on the 1989-94 Teachers Retirement Experience.

TABLE 13

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Step Salary Increase Experience
1989 - 1994

Years of Service	Actual	Expected
1	6.1%	3.7%
2	4.1%	3.7%
3	6.3%	3.7%
4	3.6%	3.7%
5	4.2%	3.7%
6	5.0%	3.7%
7	2.5%	3.7%
8	2.5%	3.7%
9	2.5%	3.7%
10	3.8%	3.7%
11	.7%	3.7%
12	2.1%	3.7%
13	2.7%	3.7%
14	3.1%	3.7%
15	.6%	0%
16	.6%	0%
17	.7%	0%
18	.7%	0%
19	.8%	0%
20	.5%	0%

TABLE 14

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Plan I and Plan II
Step Increases

Years of Service	Percent Increase	Multiple of Entry Salary
1	5.0%	1.050
2	4.5%	1.097
3	4.2%	1.143
4	3.8%	1.187
5	3.6%	1.230
6	3.5%	1.273
7	3.3%	1.315
8	3.2%	1.357
9	3.1%	1.399
10	3.0%	1.441
11	3.0%	1.484
12	3.0%	1.528
13	3.0%	1.574
14	2.5%	1.614
15	1.5%	1.638
16+	.5%	

NOTE: The above includes only step increases. During the 1989-1994 period, general salary increases averaged 5.4%

DEVELOPMENT OF AVERAGE FINAL COMPENSATION (AFC)

The TRS I benefit is a function of the highest two consecutive school years salary (usually the last two). There is great incentive for the member to boost their AFC since they will reap the rewards for a lifetime.

Preliminary studies indicate we should increase projected AFCs by at least 2% to match experience. Further study is needed to explain the cause of the increase.

PERCENT MARRIED, PERCENT SURVIVORS

Percent Married

Percent Married is the percentage of active members who have a spouse eligible for survivor benefits upon the member's death.

Old Basis: Table based on 1985-88 Teachers Retirement System experience.

New Basis: Table based on 1989-94 Teachers Retirement System experience.

Percent Survivors

Percent Survivors is the percentage of retirees who have selected a continuing benefit option whose beneficiary is still alive at the retiree's death.

Old Basis: Table based on 1985-88 Teachers Retirement System experience.

New Basis: Table based on 1989-94 Teachers Retirement System experience combined with projection of the newly adopted mortality table, UP 94 (-3,-1).

TABLE 15

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Percent Married*

Age	Male	Female
20	30%	40%
25	35%	40%
30	40%	40%
35	45%	40%
40	50%	35%
45	65%	40%
50	70%	45%
55	75%	50%
60	85%	60%

* Percentage of members with a spouse who is eligible for a survivor benefit

TABLE 16

WASHINGTON STATE TEACHERS
RETIREMENT SYSTEM

Percent Survivors*

Age	Male	Female
60	100%	99%
65	98%	94%
70	94%	85%
75	87%	73%
80	78%	56%
85	64%	37%
90	46%	19%
95	25%	6%

* Percentage of retired members with a continuing benefit option whose beneficiary is alive.

SELECTION OF OPTION CODES

Retiring members of TRS may select any of four retirement options:

Option 0:	Reduced payments for the life of the member, lump sum payment at death is equal to the excess of the member's accumulated contributions, over annuity payments received.
Option 1:	Payments for the life of the member.
Option 2:	Reduced payments for the life of the member, continued for the life of a beneficiary at the same level.
Option 3:	Reduced payments for the life of the member, continued for the life of a beneficiary at half the level paid when both were alive.

Retiring members choose the options with the following frequency:

Option 0:	44.7%
Option 1:	24.3%
Option 2:	17.1%
Option 3:	13.9%
	100.0%

CERTAIN AND LIFE ANNUITIES

TRS I

Option 0 provides the following death benefit: If the retiree dies before the total of annuity payments exceeds the member's accumulated contributions, the difference is paid to a beneficiary in a lump sum. On average, it takes about 11 years for cumulative annuity benefits to exceed the accumulated employee contributions. For members who select this option, the annuity represents 20% of the total benefit.

TRS II

The standard retirement option is a monthly benefit payable for the life of the member. If the retiree dies before the total of payments exceed the member's accumulated contributions, the difference is paid to a beneficiary. In valuing liabilities, we will recognize this death benefit by using a life annuity with a 4 year certain payment.

TRS I WITHDRAWN ANNUITY

A provision unique to TRS I is the option at retirement for the member to receive their accumulated contributions in cash and an actuarially reduced monthly benefit. The member may withdraw part or all of their funds. The table below displays recent experience:

Year	Total Retirements	Number Making Full Withdrawal	Percent Making Full Withdrawal	Number Making Partial Withdrawal	Percent Making Partial Withdrawal	Average Full Withdrawal	Average Partial Withdrawal
1989	1,117	608	54%	123	11%	$44,851	$17,652
1990	1,158	619	53%	278	24%	$49,788	$20,809
1991	1,070	533	50%	320	30%	$54,018	$18,948
1992	1,072	504	47%	356	33%	$57,945	$19,194
1993	2,011	747	37%	898	45%	$57,725	$17,356
1994	1,571	941	60%	344	22%	$63,967	$17,501
Total	7,999	3,952	49%	2,319	29%	$54,716	$18,577

The above indicates 49% (3,952 ÷ 7,999 = 49%) withdraw all of their accumulated contributions and 29% (2,319 ÷ 7,999 = 29%) withdraw part of their funds. Because the withdrawal and concomitant reduction in monthly pension is on an actuarially equivalent basis, these results do not affect the system's annual valuations. They do, however, have a profound impact on cash flows.

There were early retirement windows in both 1992 and 1993. Because of the increased workload, the data for the fiscal years 1993 and 1994 contain certain data anomalies. Although some of the "Full Withdrawals" appear to have been mislabeled as "Partial Withdrawals," we are confident the average withdrawal is reasonable.

NEW ENTRANTS

Following are the distributions of new entrants as used in projecting plan membership. New members enter the projection system not only for growth, but also to replace members who leave by reason of retirement, death, termination, or disability.

	MALES		FEMALES	
	Lives per 10,000 New Entrants	Salary as a Percentage of all New Entrants	Lives per 10,000 New Entrants	Salary as a Percentage of all New Entrants
25	722	86.1%	724	85.6%
30	454	94.7%	351	96.3%
35	315	101.6%	225	102.4%
40	222	113.5%	325	102.9%
45	269	117.8%	303	115.5%
50	111	127.7%	92	121.7%
55	51	131.3%	22	124.5%

AGE DIFFERENCE

The average age difference between a member and spouse/beneficiary is used in two contexts:

If the member dies in service with 10 or more years of service credit, a surviving spouse may elect a survivor annuity. The amount of the optional benefit is a function of the age of the spouse.

When a member retires and selects a joint and survivor option, the beneficiary is usually a spouse but it is sometimes a child, grandchild, etc. These beneficiaries tend to be younger than the member.

Below are the average age differences: Member age minus beneficiary age.

Member	Active Retiree Surviving Spouse	Retired Member Surviving Beneficiary
Male	+2.86 years	+3.33 years
Female	-2.86 years	- 2.39 years

IV. Economic Assumptions

Economic assumptions are those used for long-term projections of all the economic factors that affect our pension systems. It may seem unreasonable to attempt a prediction of inflation and investment return over the next 60 years, but it is necessary because of the long-term obligations created by our pension systems. The potential obligation is created on the day of hire. The right to a benefit develops with each year of service, but the benefit is determined by the salary near retirement. Budgeting for the benefit involves estimating its size and accumulating money with investment return to cover the cost.

The impact of economic assumptions on contribution rates can be significant. Every dollar of investment return replaces a dollar of contribution; every salary increase translates into greater benefits and greater contributions. Finally, Plan I benefits are linked to the Consumer Price Index as the loss of purchasing power triggers the Plan I COLA. Thus, inflation drives up benefits.

A good set of economic assumptions are those with the best probability of producing future gains and losses that will offset each other over a long period.

Following is the current set of economic assumptions: New assumptions are to be adopted by the Economic and Revenue Forecast Council by December 31st of each odd-numbered year.

Investment Return Rate	7½ %
Salary Inflation Rate	5½ %
Consumer Price Index	5%

Growth of Active Membership

Growth in membership is assumed to be 3/4% annually. This assumption is used to determine future salaries for amortizing the Unfunded Actuarial Accrued Liability.

V. Actuarial Valuation Method

The Funding Statutes (Chapter 41.45 RCW) require:

Plan I to be funded as a level percentage of all future pay needed to fully amortize the total cost of Plan I not later than June 30, 2024.

Plan II to be funded using the Aggregate Actuarial Cost Method.

To satisfy these funding goals we will use a version of the Entry Age Cost Method. Under this method, the Normal Cost of benefits is determined as that contribution rate which, if paid from entry date to retirement date on behalf of the average member of the system, would fully support such member's benefits.

The contribution rate is developed as the sum of the Normal Cost and a rate to amortize the Unfunded Actuarial Liability as a percentage of all future pay by June 30, 2024. Because all future members of TRS are to be in Plan II, we will apply the Normal Cost developed in Plan II to Plan I.

These assumptions will be reviewed in 1995 in our review of economic assumptions.